BRIDGE NO. A-02-023 (MARTIN STREET OVER FORT POND BROOK)

Bridge Description and Orientation:

The Martin Street Bridge over Fort Pond Brook is a twin corrugated steel pipe arch culvert that was built in 1965 (see Sketches and Photos #1, #2 & #3). Martin Street, at the bridge, is oriented North and South over the Fort Pond Brook which flows West to East. The pipe arches are labeled South and North.

Summary of Existing Conditions:

Bridge Rail & Approach Guardrail Deficiencies (NBIS Item #36 in Inspection Report)

Element	Deficiency	Reference Photo(s)
Bridge Rail / Approach Guardrail	• No deficiencies noted	3

Top of Bridge Deficiencies (NBIS Item #58 in Inspection Report)

Element	Deficiency	Reference Photo(s)
Wearing Surface	• Light to moderate vegetation growth at all 4 approaches to the bridge	3

Superstructure Deficiencies (NBIS Item #59 in Inspection Report)

Element	Deficiency	Reference Photo(s)
Corrugated Steel Pipe Arch Culvert	• Random missing connection bolts and minor deterioration of the protective coating with the majority of the protective coating failing along the waterline • Minor accumulation of debris along the bottom of both pipe arches • Moderate aggradation at the West end of both pipe arches • East end of North and South pipe arches are undermined up to 8" • West end of North and South pipe arches are undermined up to 12" • Moderate to severe rusting with minor steel delamination along the lower haunch of both pipe arches, located approximately 12" above the bottom of barrel, just below the seam of the arch sections	2 4, 5, 6

	• Hole in South pipe arch (North face), located 8'-7" from East end, that measures 2"L x 5"H x up to 4" of penetration	
	• Hole in South pipe arch (South face), located 12'-0" from East end, that measures 1" in diameter x up to 1.5" of penetration	
	• Hole in South pipe arch (South face), located 13'-6" from East end, that measures 2.5"L x 1.5"H x up to 2.5" of penetration	
	• Hole in South pipe arch (South face), located 21'-8" from East end, that measures 2"L x 2.5"H x up to 1" of penetration	
	• Hole in South pipe arch (South face), located 33'-8" from East end, that measures 3.5"L x 3"H x up to 3" of penetration	7
	• 3 holes in South pipe arch (South face), located 36'-8" from East end, that measure 3"L x 3"H x up to 3" of penetration, 4"L x 5"H x up to 3.5" of penetration and 3"L x 5"H x up to 4" of penetration	8
	• Hole in North pipe arch (North face), located 16'-0" from East end, that measures 1"L x 2"H x up to 1" of penetration	9
	• Hole in North pipe arch (North face), located 18'-6" from East end, that measures 3"L x 3"H x up to 1" of penetration	
	• Hole in North pipe arch (North face), located 27'-0" from East end, that measures 2"L x 2"H x up to 3" of penetration	
	• Hole in North pipe arch (North face), located 40'-0" from East end, that measures 4"L x 5"H x up to 2" of penetration	10
	• Hole in North pipe arch (North face), located 41'-6" from East end, that measures 4"L x 2.5"H x up to 3" of penetration	10
	• Hole in North pipe arch (North face), located 42'-0" from East end, that measures 2"L x 1"H x up to 2" of penetration	10
West Headwall	• Light to heavy vegetation growth	11
	• Random narrow to medium cracks in mortar, minor settlement of the stone throughout and minor erosion at the South side of the South pipe arch	
	• Void in 2nd row from channel bottom between pipe arches that measures full width x 6"H x up to 19"of penetration	1
	• Void between South face of North pipe arch and West headwall that measures 16"H x 2"W x up to 26" of penetration	1
East Headwall	• Wide crack in mortar over South pipe arch	
	• Void at the North face of the South pipe arch and the headwall that measures 11"H x 8"W x up to 1" of penetration	2

	• Void at bottom of headwall between pipe arches that measures 8.5"L x 3"W x up to 12" of penetration • Void at South face of North pipe and headwall that measures 9"H x 6"W x up to 4'-9" of penetration	2 2

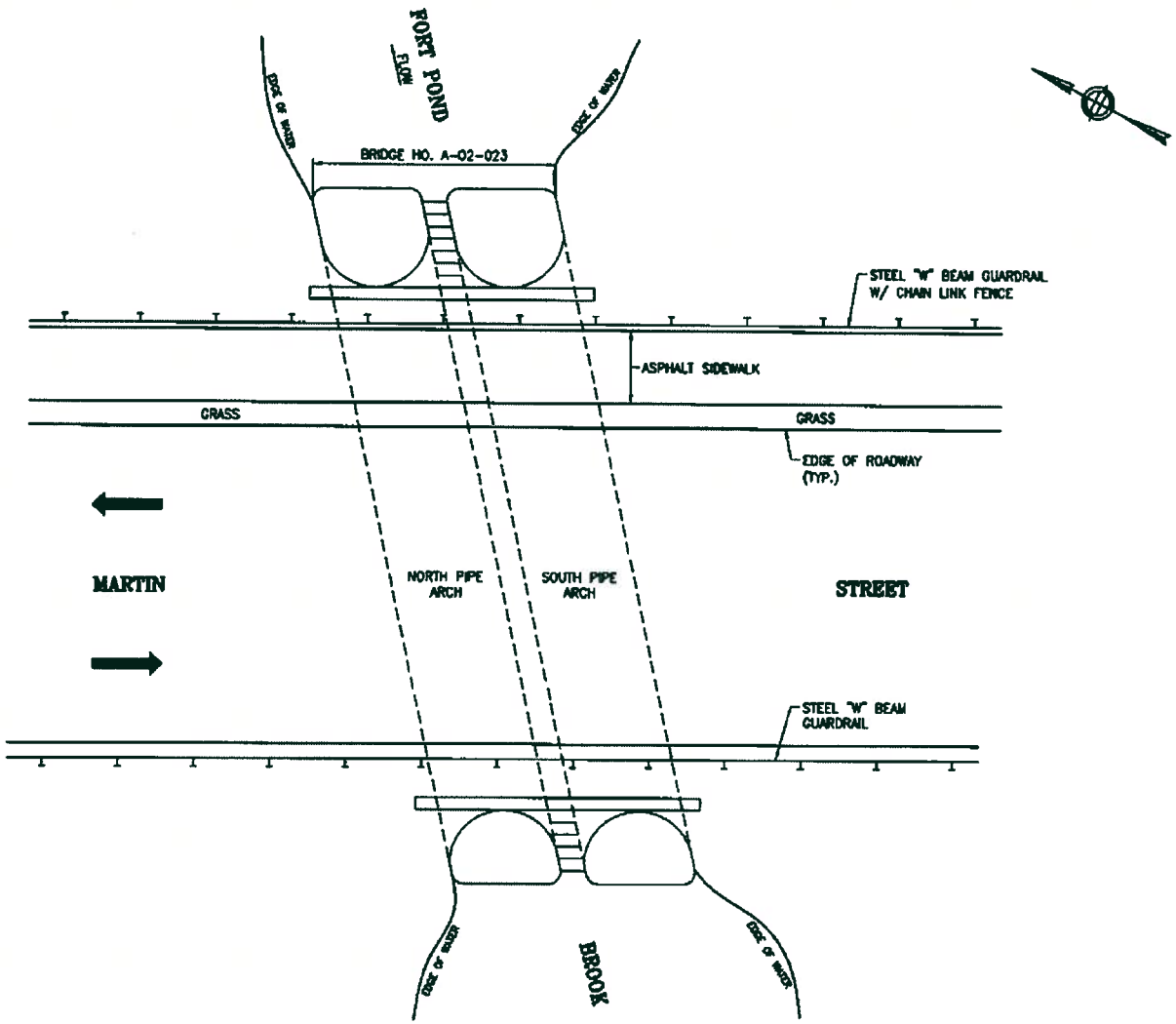
Abutment/Foundation Deficiencies (NBIS Item #60 in Inspection Report)

Element	Deficiency	Reference Photo(s)
Wingwalls	• Light to moderate vegetation growth throughout all 4 wingwalls	

Recommended Maintenance:

The following table outlines the deficiencies and repairs needed, along with the priority of the repair, to the Martin Street Bridge over Fort Pond Brook:

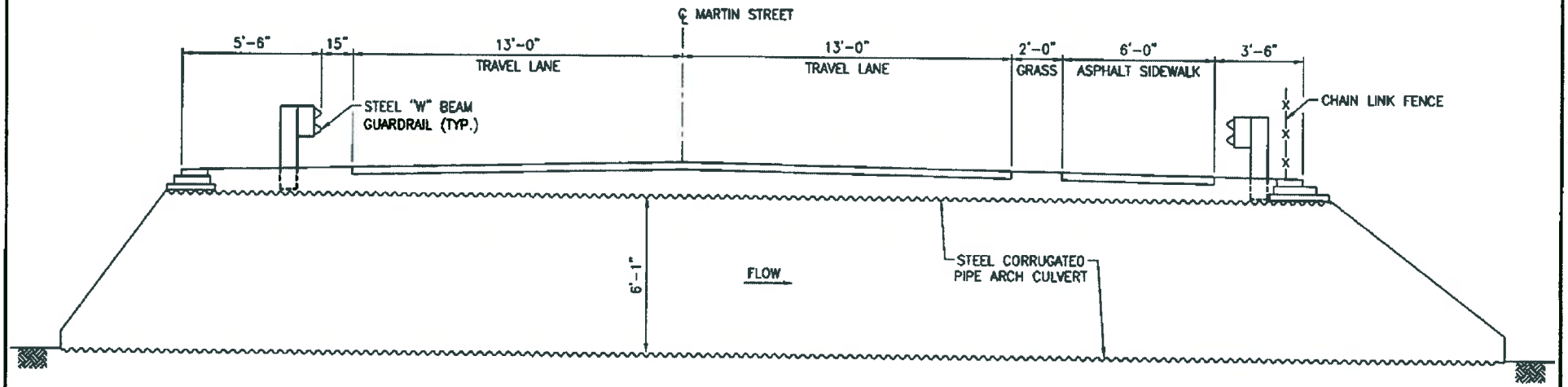
Element & Location		Deficiency	Repair Needed	Priority
#1	Protective coating of pipe arches	Cracking and peeling throughout	Clean and reseal with protective coating throughout	High
#2	East end, both pipe arches	Undermining up to 8"	Place riprap at ends and seal voids around pipe arches	High
#3	West end, both pipe arches	Undermining up to 12"	Place riprap at ends and seal voids around pipe arches	High
#4	Haunch of both pipe arches	Moderate to severe rusting	Pave inverts full length within normal water range	High
#5	South pipe arch, South face	Numerous holes in arch at haunch	Repair holes prior to placing new paved invert	High
#6	South pipe arch, North face	Hole in arch at haunch	Repair holes prior to placing new paved invert	High
#7	North pipe arch, North face	Numerous holes in arch at haunch	Repair holes prior to placing new paved invert	High
#8	Stone masonry headwalls	Narrow to medium cracks in mortar	Repoint stone masonry headwalls as needed	Low
#9	Pipe arch / headwall ends	Voids around pipe arches and undermining of pipe arches	Fill voids with concrete to seal gaps	High



CHAS. H. SELLS, INC.

Consulting Engineers, Surveyors & Photogrammetrists

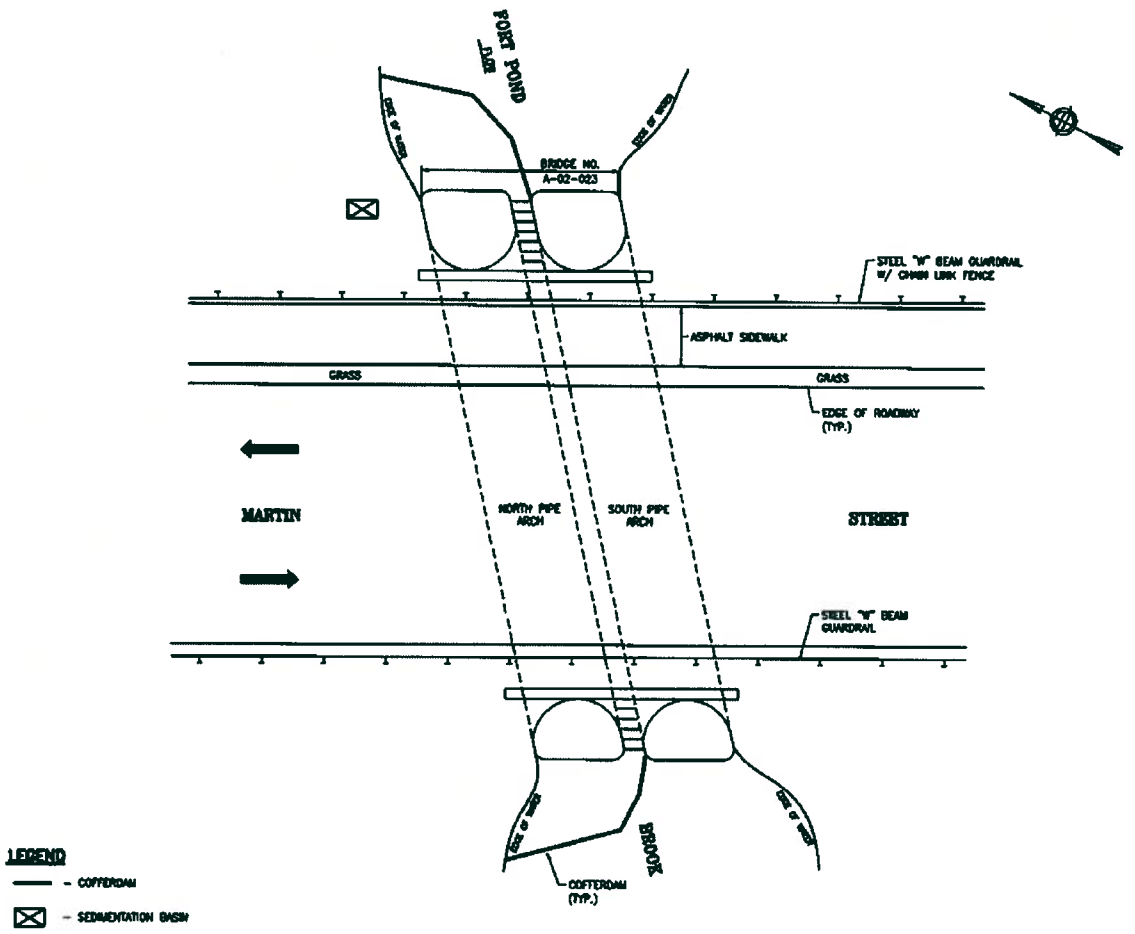
ACTON: MARTIN STREET OVER
FORT POND BROOK, BRIDGE NO. A-02-023
PLAN – SCALE: N.T.S.



CHAS. H. SELLS, INC.

Consulting Engineers, Surveyors & Photogrammetrists

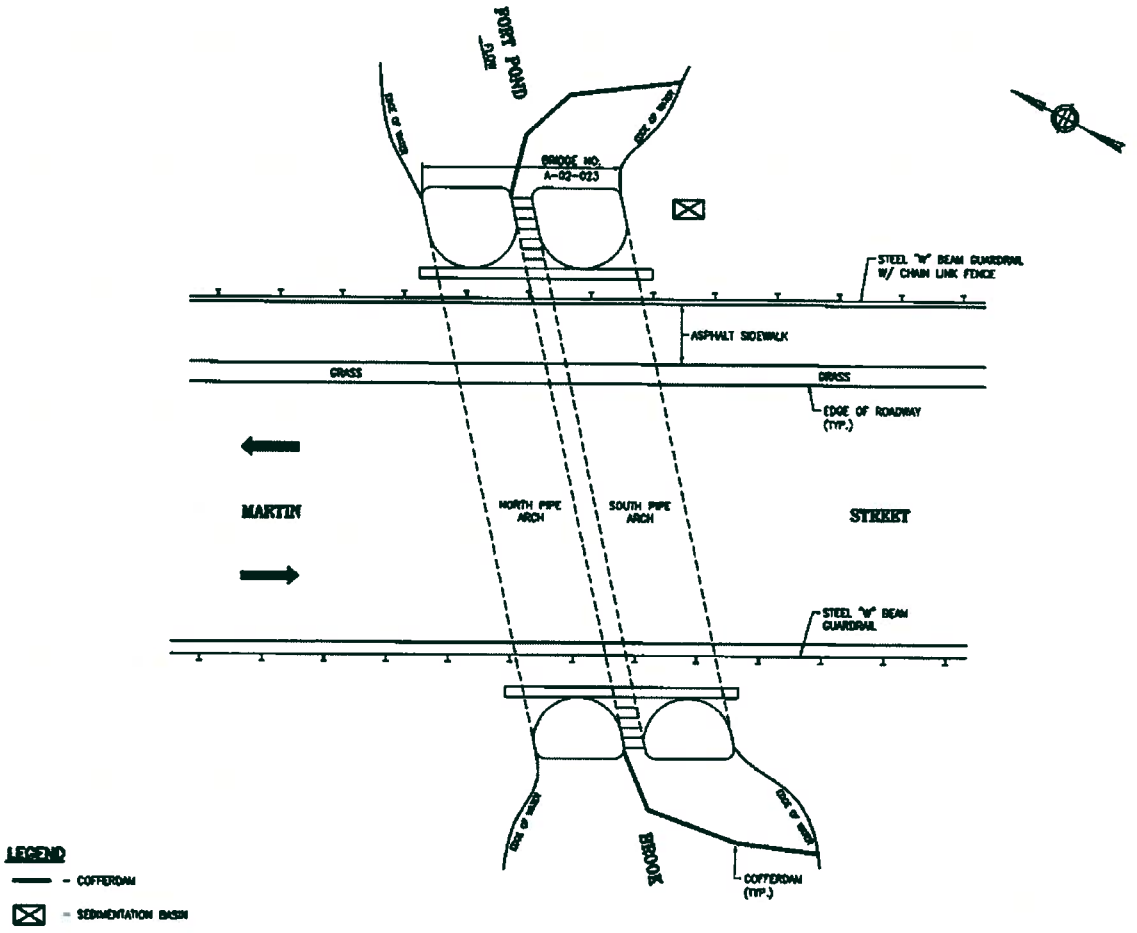
ACTON: MARTIN STREET OVER
FORT POND BROOK, BRIDGE NO. A-02-023
BRIDGE TRANSVERSE SECTION – SCALE: N.T.S.



STAGE I

CHAS. H. SELLS, INC.
Consulting Engineers, Surveyors & Photogrammetrists

ACTON: MARTIN STREET OVER
FORT POND BROOK, BRIDGE NO. A-02-023
WATER CONTROL PLAN – SCALE: N.T.S.



STAGE II

CHAS. H. SELLS, INC.

Consulting Engineers & Environmentalists

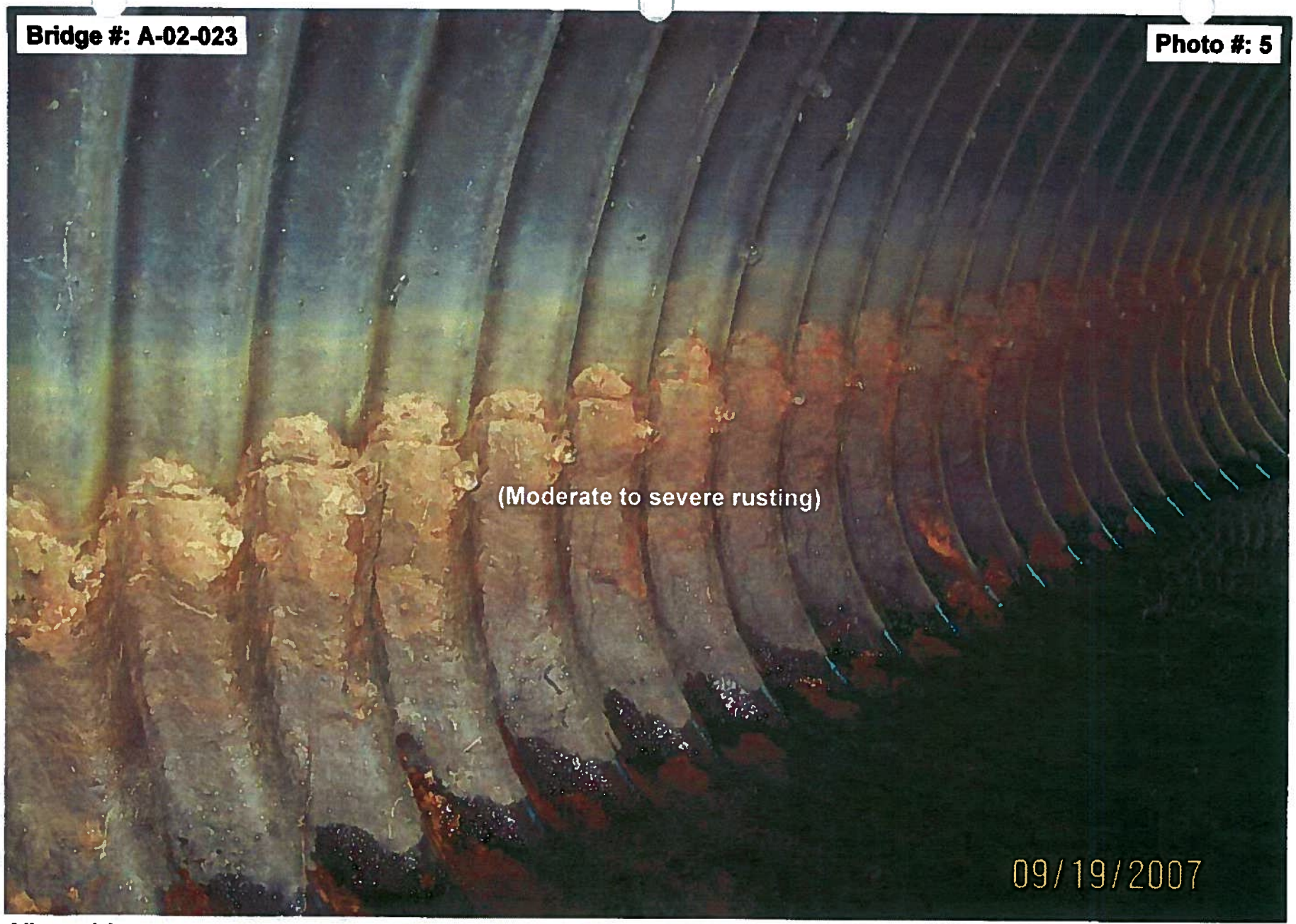
ACTON: MARTIN STREET OVER
FORT POND BROOK, BRIDGE NO. A-02-023
WATER CONTROL PLAN – SCALE: N.T.S.


Bridge #: A-02-023
Photo #: 1
09/19/2007
West Elevation View, looking West.

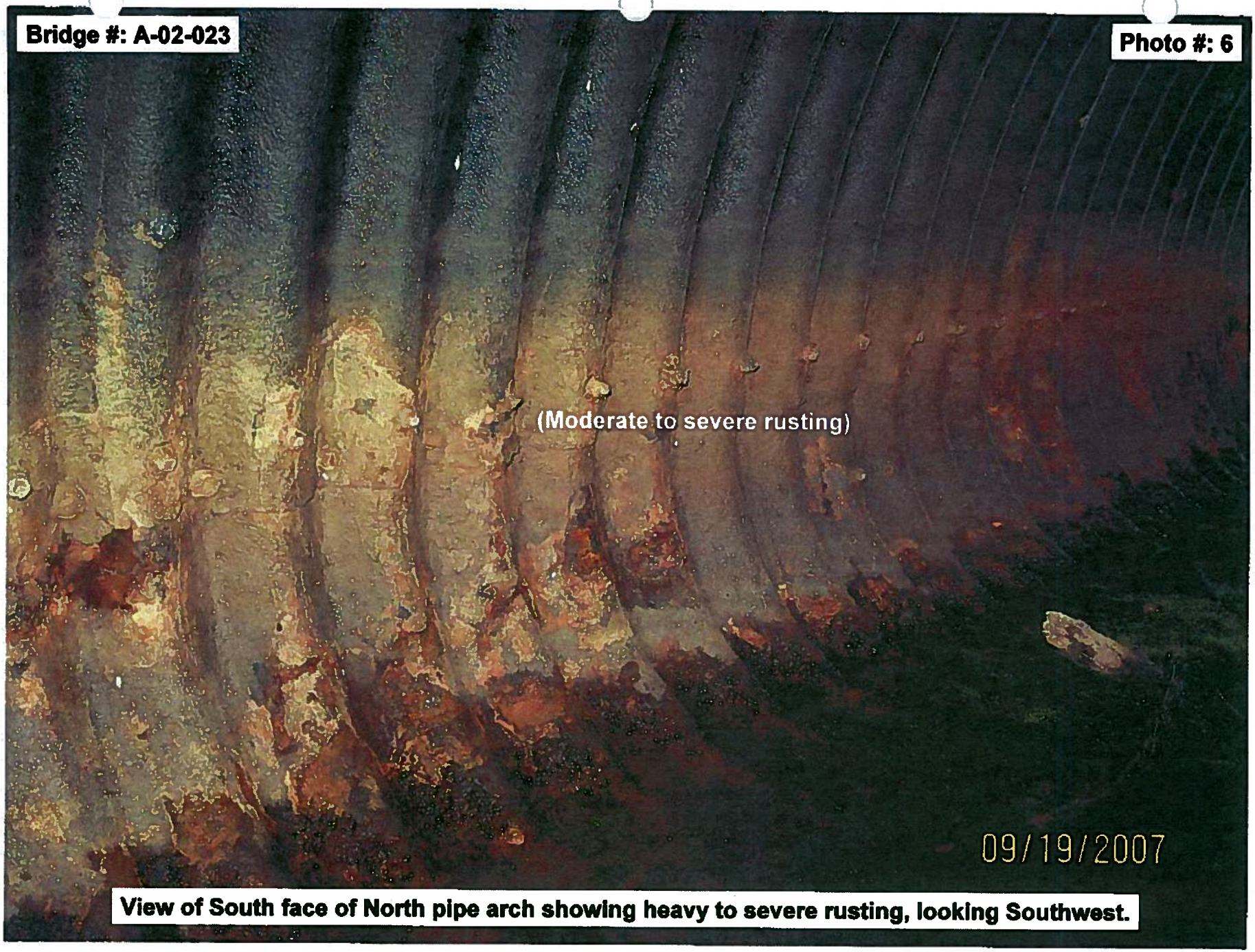

Bridge #: A-02-023
Photo #: 2
09/19/2007
East Elevation View, looking Southwest.

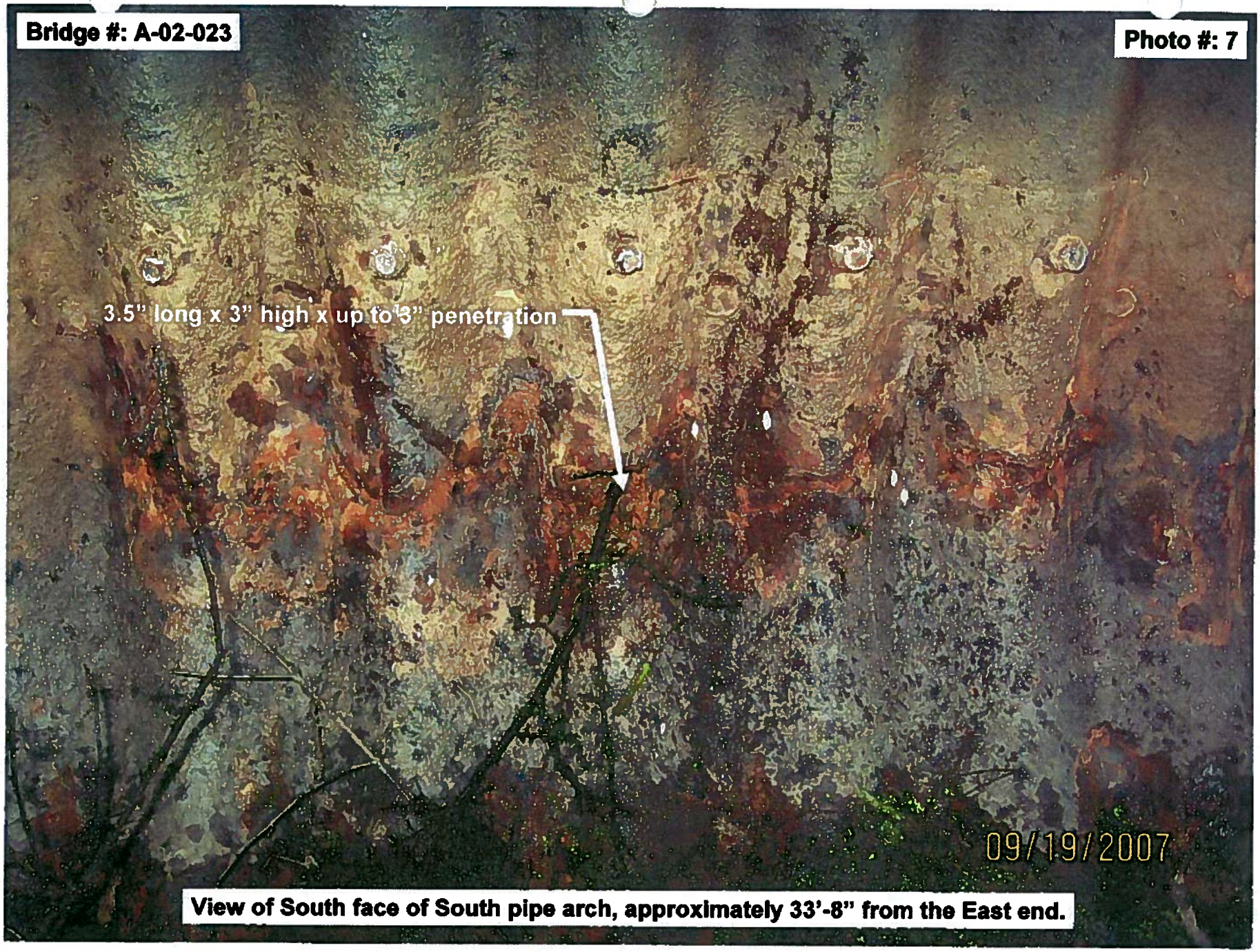

Bridge #: A-02-023
Photo #: 3
View of South approach roadway looking North across bridge.

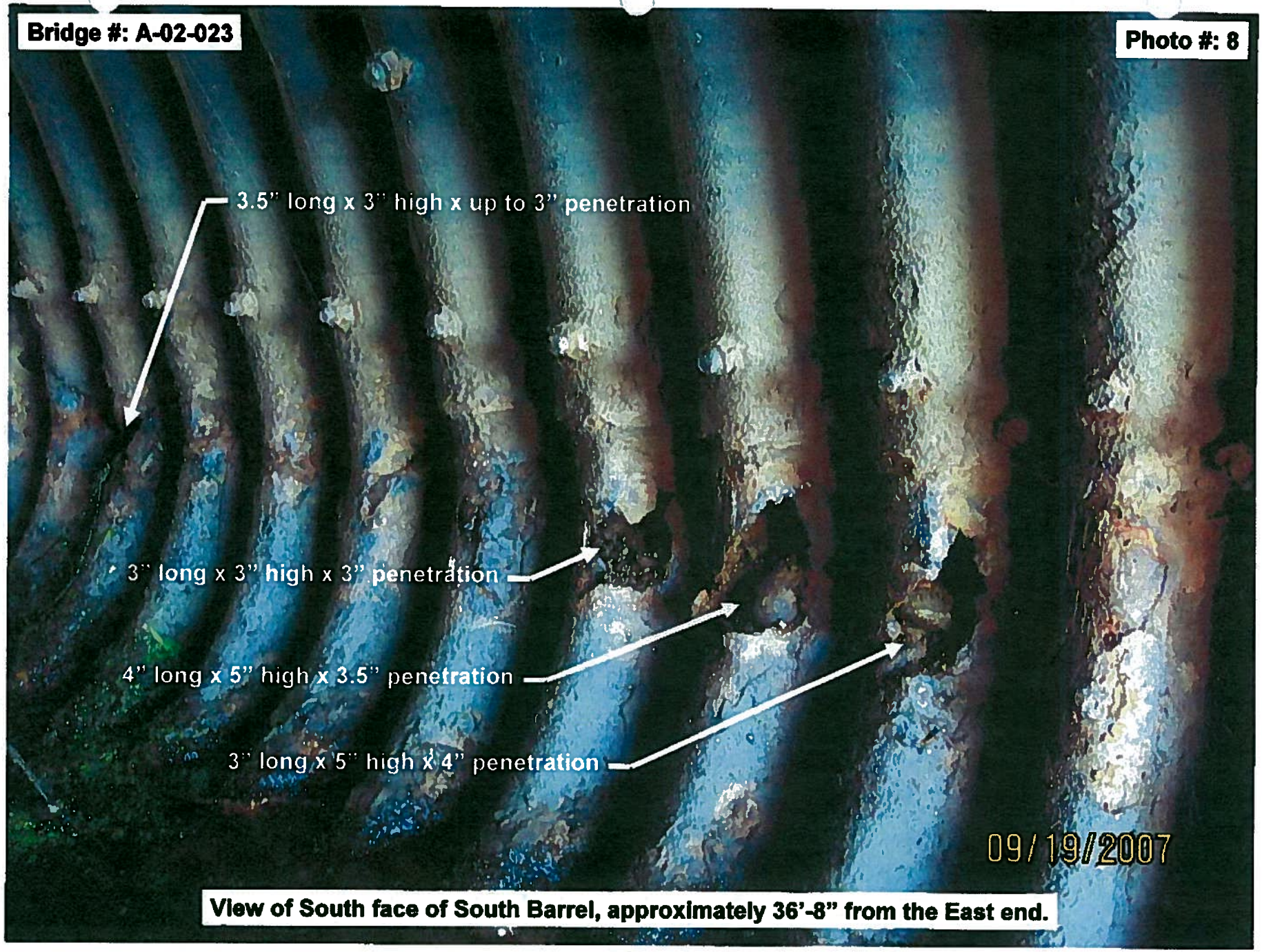
View of South face of South pipe arch (near the East end) showing heavy to severe rusting, looking Southwest.

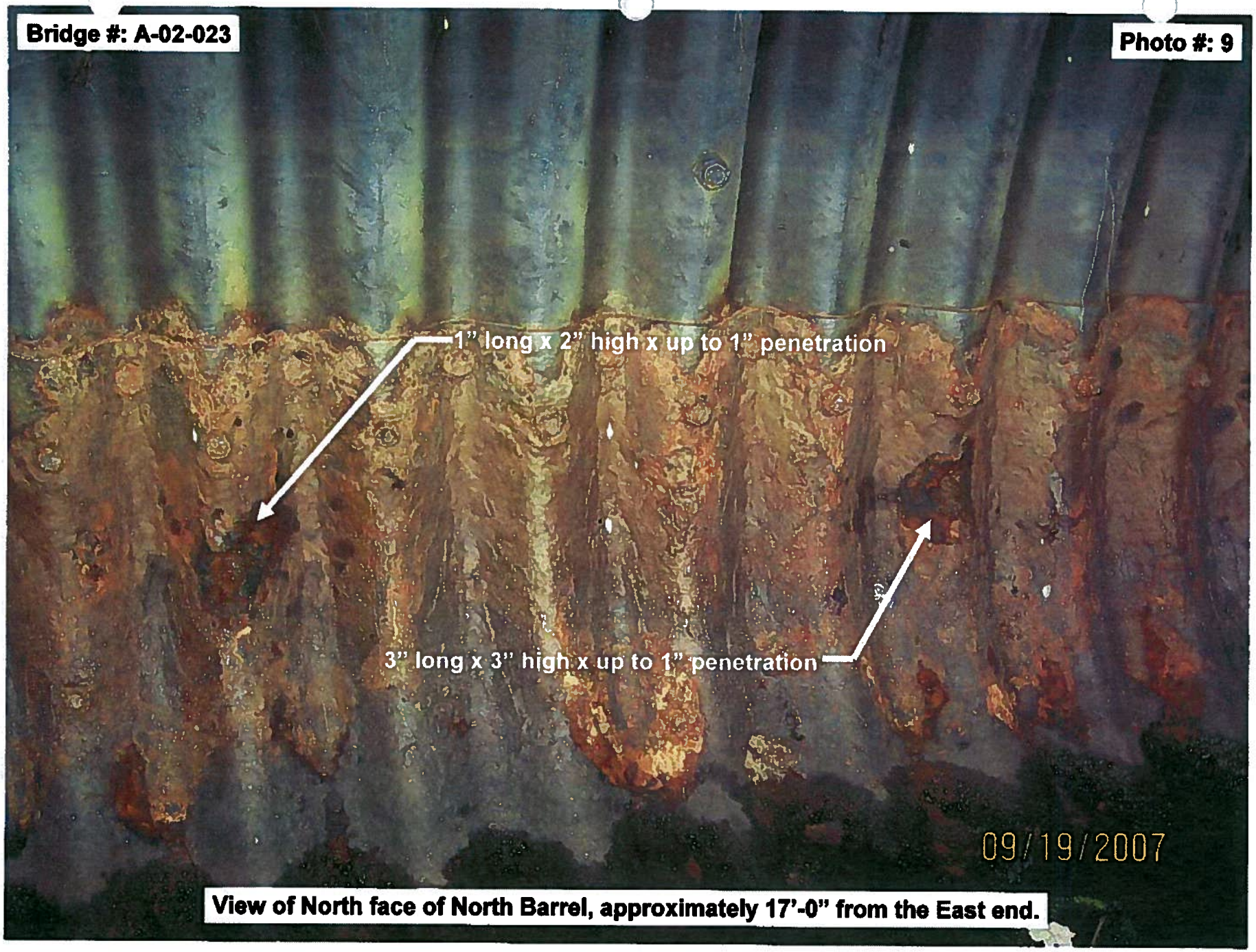


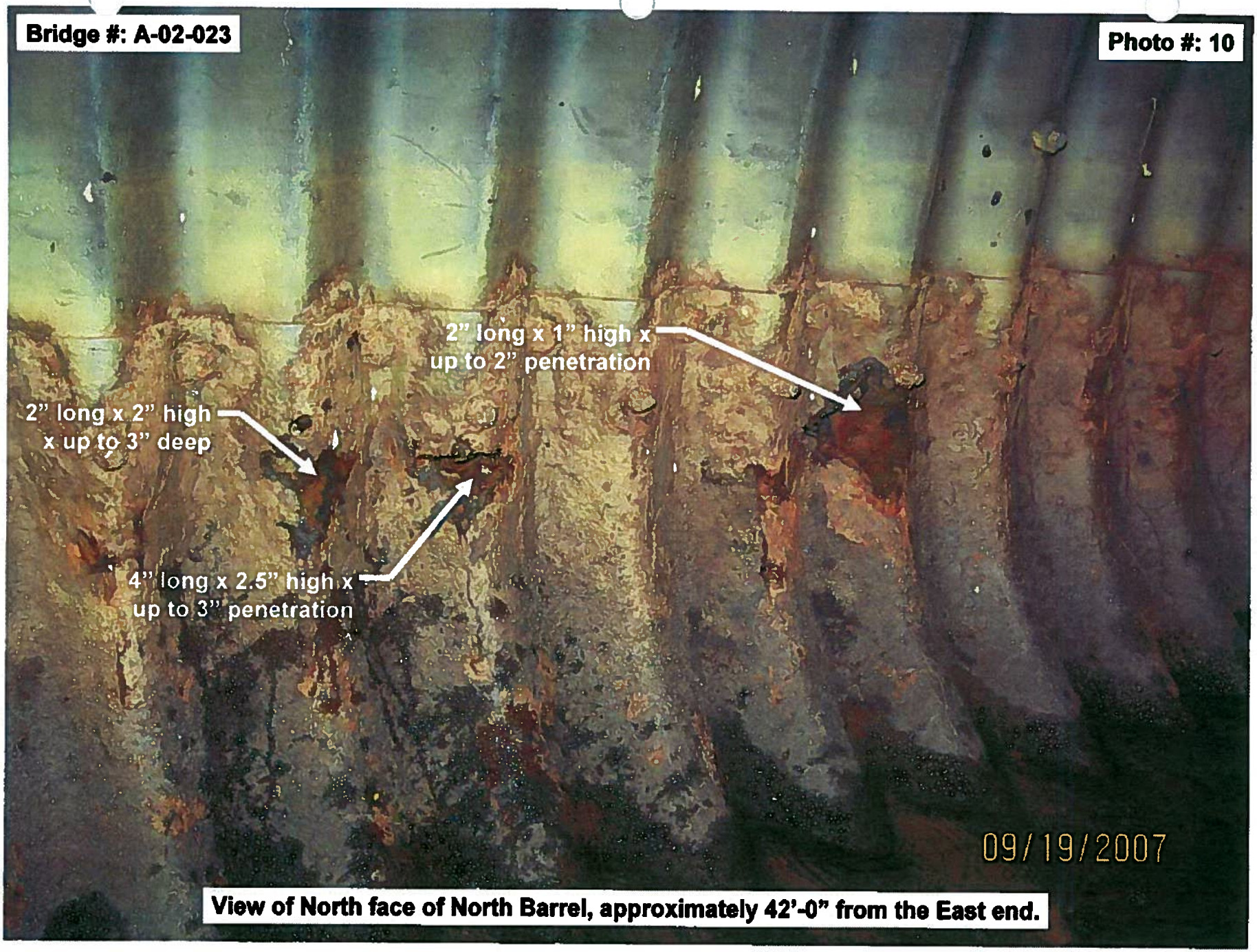
View of South face of South pipe arch (near the midspan) showing heavy to severe rusting, looking Southwest.


Bridge #: A-02-023
Photo #: 6
(Moderate to severe rusting)
09/19/2007
View of South face of North pipe arch showing heavy to severe rusting, looking Southwest.


Bridge #: A-02-023
Photo #: 7
3.5" long x 3" high x up to 3" penetration
09/19/2007
View of South face of South pipe arch, approximately 33'-8" from the East end.


Bridge #: A-02-023
Photo #: 8
3.5" long x 3" high x up to 3" penetration
3" long x 3" high x 3" penetration
4" long x 5" high x 3.5" penetration
3" long x 5" high x 4" penetration
09/19/2007
View of South face of South Barrel, approximately 36'-8" from the East end.


Bridge #: A-02-023
Photo #: 9
1" long x 2" high x up to 1" penetration
3" long x 3" high x up to 1" penetration
09/19/2007
View of North face of North Barrel, approximately 17'-0" from the East end.


Bridge #: A-02-023
Photo #: 10
2" long x 1" high x
up to 2" penetration
2" long x 2" high
x up to 3" deep
4" long x 2.5" high x
up to 3" penetration
09/19/2007
View of North face of North Barrel, approximately 42'-0" from the East end.

Bridge #: A-02-023

Photo #: 11

View of Southwest corner of the bridge showing heavy vegetation growth, looking East.